

Individual Dwelling Units and Heat Pump Water Heaters

2022 HPWH Building Code Assistance Sheet

For prescriptive and mandatory requirements of other water heating systems and configurations refer to the 2022 Building Energy Efficiency Standards single family sections 150.0(n) for mandatory requirements, 150.2(b) for alterations, 150.2(a) for additions, or 150.1(c) for new construction. For multifamily refer to sections 160.4 for mandatory requirements, 180.2(b) for alterations, 180.1(a) for additions, or 170.2(d) for new construction.

Related Resources:

[HPWH Code Requirements](#) | [HPWH Permit Supplement Template](#) | [Electrical Load Estimator](#)

When does the 2022 Code allow HPWHs?

	Performance Path	Prescriptive Path
New Construction	Allowed	Allowed (detailed in HPWH Code Requirements)
Additions installing a 2 nd water heater	Allowed	Allowed (detailed in HPWH Code Requirements)
Alterations	Allowed	Allowed (detailed in HPWH Code Requirements)

Can a plumber (C-36 license) or HVAC contractor (C-20 license) apply for a permit for a HPWH? Yes! If:

- The HPWH does not include electrical work, OR
- The HPWH does require electrical work and the Authority Having Jurisdiction (AHJ) has a water heater permit or a joint plumbing/electrical permit, OR
- An electrical permit is required for a new panel, new circuit, etc., that permit can be applied for by a C-20 and/or C-36 licensed contractor in a Joint Venture with an Electrical Contractor (C-10 license), by a C-10 Contractor, or by a General (B).

What is required for a HPWH on the required CF1R-ALT-05-E Compliance Form¹ and Permit Application?

- **Water Heater Type:** Heat Pump Water Heater
- **Fuel Type:** Electric
- **Heating Efficiency Type:** Uniform Energy Factor (UEF)
- **Heating Efficiency Value:** "NEEA Tier 3" or higher is required or meet all the following conditions:
 - The HPWH storage tank is located in the garage or conditioned space, the HPWH is located on an incompressible rigid surface of R-10 or higher, and a communication interface is installed that either meets the requirements of Section 110.12(a) or has an ANSI/CTA-2015-B communication port.
 - Any HPWH used must have an efficiency value \geq the minimum UEF in accordance with federal appliance standards, which are provided here: https://www.energy.ca.gov/sites/default/files/2022-10/2022_WaterHeating_EfficiencyGuide_ADA.pdf

Field	Field Name	Data Entry 1	Data Entry 2	Data Entry 3
02	Water Heating System ID or Name			
03	Water Heating System Type			
04	System Option (from §150.2(b)1Hiii)			
05	Water Heater Type			
06	Volume			
07	Fuel Type			
08	# of Water Heaters in System			

Source: <https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency-3>

What else is required to submit along with the permit?

Each jurisdiction has its own submittal requirements for a HPWH. Confirm AHJ-specific requirements with the building department. Be prepared to offer the following information during permit application or inspection:

- An **electrical line/circuit diagram** may be required, especially if the HPWH requires a new electric circuit, a new manual disconnect, or a new service panel. Applicants may use the HPWH Permit Supplement Template if AHJ deems appropriate.
- A **site diagram** may be required, especially if the HPWH is installed in a new location. Site diagrams should include the location of the water heater and demonstrate sufficient air volume and/or ventilation per manufacturer's specifications. Applicants may use the HPWH Permit Supplement Template if AHJ deems appropriate.
- **Electrical load calculations** may be required, especially if the HPWH adds to the building's electric load. If not required at permit application, have an electrical load calculation specific to the project site ready at inspection. Accepted load calculations can be developed in accordance with National Electric Code Sections 220.83b and 220.87. An electrical load calculation. Applicants may use the Electrical Load Estimator if appropriate.
- **Structural load calculations** may be required, especially if the HPWH is installed in a new location with raised floors, or if a HPWH with a larger tank is installed in the existing water heat location. If not required at permit submittal, have all structural

¹ Similar for CF1R-ALT-01 (altering other parts of the house) and CF1R-ADD-01 (prescriptive addition)

load calculations required for the project ready at final inspection.

2022 HPWH Building Code Requirements

BayREN and TECH Clean California offer this summary of California state level building code requirements for the installation of HPWHs. This is intended to assist permit applicants and building department staff to submit, review, approve, install, and inspect heat pump water heater alterations in single family homes.

Can a HPWH replace an existing water heater and is it allowed at the site?

For Single-Family New Construction, yes **IF**:

- The HPWH is rated as NEEA Tier 3 or higher; **OR**
- The HPWH is not NEEA Tier 3 or higher but meets minimum federal appliance standards and has the storage tank located in the garage or conditioned space; **OR**
- It can be demonstrated that the project complies with Energy Code using the performance method. § 150.1(b)1

For Single-Family Additions and Alterations, yes **IF**:

- The HPWH is rated as NEEA Tier 3 or higher (§ 150.2(a)1Dii and § 150.2(b)1Hiii); **OR**
- The HPWH storage tank is not located outdoors and is located on an incompressible rigid surface R-10 or higher. The water heater shall be installed with a communication interface that either meets the requirements of Section 110.12(a) or has an ANSI/CTA-2015-B communication port. (§ 150.2(a)1Di and § 150.2(b)1Hiiib); **OR**
- It can be demonstrated that the project complies with Energy Code using the performance method. (§ 150.2(b)2).

For Multifamily New Construction and Additions, yes **IF**:

- The HPWH meets the federal minimum efficiency requirements. **OR**
- The HPWH is rated as NEEA Tier 3. **OR**
- It can be demonstrated that the project complies with Energy Code using the performance method. (§ 180.1(b))

For Multifamily Alterations, yes **IF**:

- The HPWH is rated as NEEA Tier 3 or higher (§ 180.2(b)3Ciii); **OR**
- The HPWH storage tank is not located outdoors and is located on an incompressible rigid surface R-10 or higher. The water heater shall be installed with a communication interface that either meets the requirements of Section 110.12(a) or has an ANSI/CTA-2015-B communication port. (§ 180.2(b)3Cii); **OR**
- The water-heating system determined by the Executive Director to use no more energy than the one specified in Sections 180.2(b)3Ci through iii; or if no natural gas is connected to the existing water heater location, a water-heating system determined by the Executive Director to use no more energy than the one specified in Section 180.2(b)3Civ (§ 180.2(b)3Cv).

General Water Heater Requirements

- The installed HPWH matches what is on the approved CF1R form².
- Accessible new and existing hot and cold-water pipes from the storage tank shall be insulated according to § 150.0(j)
- Condensate waste removal, and if necessary, a drop/overflow basin and drainage piping. Note that condensate contains no combustion products or acids and so may be drained to sanitary sewer or to outside via a hose.
- Seismic bracing for the storage tank.

HPWH Issues Specific to Tank Size and Installation Location

- HPWH will be installed in a location with sufficient air volume or ventilation per manufacturer's required specifications.
- Safety bollards are present or will be installed if heat pump water heater is installed in garage in the normal path vehicle per 507.13 requirements
- If the water heater being replaced was a natural gas water heater, the natural gas line has been capped off, and gas valve removed.

Electric Circuit and Service Panel

- New electric circuit, conduit, manual disconnect, or visible circuit breaker will be installed that is sufficient for the HPWH.
- Existing electric service panel is sufficient for the building's new load with the HPWH, **OR**
- Electric service panel sufficient for the building's new load will be installed, **OR**
- Existing electric service panel is sufficient for the building's new load with the HPWH because a circuit pausing device or method will be used and will be connected to the dedicated HPWH circuit.

² Similar for CF1R-ALT-01 (altering other parts of the house) and CF1R-ADD-01 (prescriptive addition)